

A TEMPORARY AQUEOUS AEROSOL PAINT COMPOSITION
AND A METHOD FOR PREPARING THE COMPOSITION

1 BACKGROUND OF THE INVENTION

2 Field of the Invention

3 The present invention is directed to a temporary aqueous
4 aerosol paint composition and a method for preparing the
5 inventive composition. In particular, the aqueous aerosol paint
6 composition of the present invention may be utilized in
7 temporary marking applications such as, for example, marking the
8 location of underground utility lines, as is common in the
9 construction industry.

10
11 DESCRIPTION OF THE RELATED ART

12 Aerosol paints are utilized in a variety of applications,
13 including those typically associated with standard (i.e. non-
14 aerosol) oil or water based paints. This is a result of the
15 numerous advantages of an aerosol delivery system. For example,
16 the application of an aerosol paint often requires less skill
17 than is typically required to properly apply a standard oil or
18 water based paint. In addition, the use of an aerosol paint
19 eliminates the need for cleaning paint brushes, paint rollers,
20 paint trays, etc., as is required after the application of
21 standard paints. Also, in certain instances, aerosol paint may
22 be readily applied to surfaces which may be awkward and/or

1 difficult to access, thereby hindering the application of
2 standard paints.

3 Due to the numerous advantages of aerosol paints, their use
4 has become widespread for both home and commercial applications.
5 One particular area of widespread commercial usage of aerosol
6 paints is in the construction industry, and in particular, the
7 non-permanent identification of various structures and/or
8 materials on or around a construction site, for example, site
9 boundaries and/or locations specified by a surveyor,
10 identification of the location of underground utility lines
11 and/or other underground structures, identification of building
12 materials, etc.

13 Historically, the aerosol paints utilized in the
14 construction industry and, in fact, aerosol paints in general,
15 comprise a mixture of volatile organic solvents, as well as,
16 typically, an equally volatile aerosol propellant. While this
17 combination of volatile compounds results in a stable and usable
18 aerosol paint composition, the hazardous aspects of such
19 volatile compounds are now all too well known. To begin, such
20 compositions are typically flammable, due to the concentration
21 of highly volatile compounds, and as such, these compositions
22 are dangerous to store, transport, and handle, and the potential
23 of a fire, or worse, an explosion, due to mishandling is a
24 constant concern. In addition, it is also now well documented
25 that exposure to such volatile organic compounds, even in

1 limited amounts, presents a health hazard to the persons who are
2 exposed to them. This exposure hazard exists for persons who
3 are directly applying such volatile compositions as well as
4 those who may simply be present in the general vicinity in which
5 they are being applied. Aside from the potential fire,
6 explosion, and health hazards presented by such volatile aerosol
7 paint compositions, such compositions are also believed to be a
8 factor in the further depletion of the ozone layer and thus,
9 they are believed to contribute to the phenomenon now commonly
10 known as "global warming," which, if left uncontrolled, is
11 believed to pose a potentially devastating threat to the very
12 existence of our planet.

13 Attempts to address the negative aspects of such volatile
14 aerosol paint compositions, as outlined above, have resulted in
15 the development of formulations which reduce and/or eliminate
16 the reliance on volatile compounds in aerosol paint
17 compositions, with varying degrees of success. For instance,
18 although a number of aerosol paint compositions have been
19 formulated which no longer require a volatile organic solvent,
20 many of these formulations still utilize a volatile organic
21 propellant, thereby still presenting the hazards presented
22 above, albeit to a somewhat lesser degree. In addition, these
23 formulations are reportedly prone to foaming problems upon
24 application, due to entrapment of the volatile organic
25 propellant in the non-volatile paint component. Also, many of

1 these formulations are known to be unstable even after only a
2 short period of time.

3 Further attempts to improve aerosol paint formulations
4 include the use of essentially non-volatile compounds in both
5 the paint component and the propellant component, however, many
6 of these formulations still reportedly exhibit excessive foaming
7 so as to limit their widespread commercial usage. In addition,
8 these later formulations still typically contain other harmful
9 organic compounds and, as such, they continue to present a
10 health hazard to persons who directly apply them or are
11 otherwise exposed to them.

12 In addition, the currently known and purportedly
13 "temporary" aerosol marking paints utilized in the construction
14 industry today are formulated such that they typically remain
15 visible from between several months to and more than a year
16 after application, depending upon the type of surface or
17 material on which they are applied, and the climatic conditions
18 in the region of application. Aside from the obvious eyesore
19 such lingering markings present, a more serious issue is the
20 safety hazard created due to potential confusion in determining
21 exactly what the various and often overlapping markings are
22 supposed to indicate. As should be appreciated, the potential
23 of a construction crew digging or drilling in an area where
24 underground gas, electric, water, and/or sewer lines are not
25 clearly identified presents a serious risk to the health and

1 well being of the crew, as well as the persons in the immediate
2 and surrounding areas.

3 As such, it would be beneficial to provide an aerosol paint
4 composition which minimizes and/or eliminates the negative
5 attributes identified above, yet is formulated for ease of
6 handling and consistency of application. More in particular,
7 such an aerosol paint composition would preferably comprise an
8 aqueous paint component, including an aqueous solvent, as well
9 as an aqueous propellant component. It would be further
10 beneficial for such an aqueous aerosol paint composition to
11 comprise compounds which minimize and/or eliminate the hazards
12 presented to users and the environment relative to the various
13 volatile and non-volatile organic compounds typically included
14 in aerosol paint compositions, as discussed above. Preferably,
15 any such aqueous aerosol paint composition would be formulated
16 to provide a highly visible marking in a variety of fluorescent
17 colors such that various structures and/or materials on or
18 around a construction site may be clearly marked so as to
19 eliminate confusion. Yet another benefit would be for such an
20 aqueous aerosol paint composition to naturally and essentially
21 completely degrade within weeks rather than months of
22 application. A further advantage would be achieved by providing
23 a simple and cost effective method for preparing and packaging
24 such a temporary aqueous aerosol paint composition to permit
25 widespread usage within the construction industry and elsewhere.

1 SUMMARY OF THE INVENTION

2 The present invention is directed to a temporary and
3 completely aqueous aerosol paint composition for use in any
4 temporary marking application such as, by way of example only,
5 marking the location of buried utility lines or other structures
6 and/or materials, as is common in the construction industry.
7 More in particular, the inventive composition of the present
8 invention comprises an aqueous paint component and an aqueous
9 propellant component.

10 To begin, the aqueous paint component of the present
11 invention comprises an aqueous solvent. The aqueous solvent may
12 comprise between generally about 50% to 90% by weight of the
13 aqueous paint component. In one embodiment, the aqueous solvent
14 comprises an amount of water. In one further embodiment, the
15 aqueous solvent comprises an amount of filtered water which has
16 been filtered specifically to remove chlorine and/or iron and/or
17 ions thereof.

18 The aqueous paint component of the present invention also
19 includes a polymeric resin, which may comprise between generally
20 about 5% to 10% by weight of the aqueous paint component. In
21 one embodiment, the polymeric resin comprises a polymeric
22 compound dispersion and, in at least one further embodiment, the
23 polymeric resin comprises a polyvinyl acetate dispersion.

24 Additionally, the composition of the present invention
25 includes at least one pigment compound, and in at least one

1 embodiment, a colored pigment compound. Another embodiment of
2 the present invention comprises a fluorescent colored pigment
3 compound. At least one other embodiment comprises a plurality
4 of colored pigment compounds, while yet another embodiment
5 comprises a white pigment compound. The aqueous paint component
6 of the present invention includes at least one pigment compound
7 in an amount between generally about 5% to 25% by weight.

8 Also, the aqueous paint component comprises at least one
9 filler compound. Similar to the pigment compounds, however, at
10 least one embodiment of the aqueous paint component comprises a
11 plurality of filler compounds. One embodiment of the present
12 invention includes the at least one filler compound in an amount
13 between generally about 1% to 10% by weight of the aqueous paint
14 component.

15 The aqueous paint component of the present invention may
16 also comprise a number of additional compounds including, but
17 not limited to, an anti-foaming agent, a dispersant, a
18 surfactant, a bactericide, and/or a light stabilizer. For
19 example, at least one embodiment the aqueous paint component
20 includes an anti-foaming agent which may comprise between
21 generally about 0.10% to 0.50% by weight of the aqueous paint
22 component. At least one other embodiment of the aqueous paint
23 component includes a dispersant comprising between generally
24 about 0.10% to 1.00% by weight, and yet one other embodiment may
25 include a surfactant comprising an amount between generally

1 about 0.05% to 1.00% by weight, while still another embodiment
2 includes a bactericide which may comprise between generally
3 about 0.01% to 0.10% by weight of the aqueous paint component.

4 In the embodiments of the present invention comprising at
5 least one flourescent colored pigment compound, the aqueous
6 paint component also preferably includes an amount of a light
7 stabilizer. In one embodiment, the present invention includes
8 a light stabilizer comprising generally about 0.6% by weight of
9 the aqueous paint component.

10 The present invention also comprises a method for preparing
11 an temporary aqueous aerosol paint composition, in accordance
12 with the composition presented above. The method of the present
13 invention comprises charging a reaction vessel with an initial
14 amount of an aqueous solvent which, as indicated above,
15 comprises water in at least one embodiment. The method of the
16 present invention also includes setting a primary mixing cycle
17 for the contents of the reaction vessel. More in particular,
18 setting the primary mixing cycle includes adjusting the mixing
19 speed to a predetermined primary mixing speed, which may be
20 expressed in revolutions per minute (rpm) of the mixing blade,
21 and maintaining this predetermined primary mixing speed for a
22 predetermined primary mixing time.

23 Additionally, the method of the present invention comprises
24 adding at least one pigment compound to the reaction vessel,
25 however, at least one embodiment includes adding a plurality of

1 pigment compounds to the reaction vessel. The method also
2 includes adding an additional amount of the aqueous solvent to
3 the reaction vessel, and setting a high velocity mixing cycle
4 for the contents of the reaction vessel (i.e. adjusting and
5 maintaining the mixing speed at a predetermined high velocity
6 mixing speed for a predetermined high velocity mixing time).

7 The method of the present invention also includes adding at
8 least one filler compound to the reaction vessel. In at least
9 one embodiment, the method of the present invention comprises
10 adding a plurality of filler compounds to the reaction vessel.
11 The method also includes setting a first low velocity mixing
12 cycle for the contents of the reaction vessel, which is set in
13 a similar manner to that described above with respect to the
14 primary and high velocity mixing cycles.

15 One preferred embodiment of the method of the present
16 invention further comprises adding a polymeric resin to the
17 reaction vessel, and setting a second low velocity mixing cycle
18 for the contents of the reaction vessel, once again, in a
19 similar manner to that described above with respect to the
20 primary and high velocity mixing cycles. In addition, the
21 method of the present invention includes adding a final amount
22 of the aqueous solvent to the reaction vessel.

23 It is understood to be within the scope of the method of
24 the present invention to comprise adding one or more additional
25 compounds to the reaction vessel including, by way of example

1 only, an anti-foaming agent, a dispersant, a surfactant, a
2 bactericide and/or a light stabilizer.

3 These and other objects, features and advantages of the
4 present invention will become more clear as the detailed
5 description are taken into consideration.

6 7 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

8 While this invention is susceptible of embodiment in many
9 different forms, there is described in detail herein at least
10 one specific embodiment, with the understanding that the present
11 disclosure is to be considered as an exemplification of the
12 principles of the invention and is not intended to limit the
13 invention to this one specific embodiment.

14 As previously indicated, the present invention is directed
15 to a temporary aqueous aerosol paint composition and a method
16 for preparing the inventive composition. More in particular,
17 the present invention is directed to an aqueous aerosol paint
18 composition which may be utilized for temporary marking of a
19 variety of items. At least one embodiment of the composition of
20 the present invention may be utilized to temporarily, yet
21 positively, identify a variety of structures and/or materials on
22 or around a construction site including, by way of example only,
23 site boundaries and/or locations specified by a surveyor,
24 locations of underground utility lines and/or other underground
25 structures, various building materials, etc.

1 The temporary aqueous aerosol paint composition of the
2 present invention comprises an aqueous paint component as well
3 as an aqueous propellant component. The temporary aqueous paint
4 component may comprise between generally about 60% to 80% by
5 weight of the inventive composition, while the aqueous
6 propellant component comprises between generally about 20% to
7 40% by weight of the aqueous aerosol paint composition.

8 The aqueous aerosol paint component of the present
9 invention comprises an aqueous solvent, the aqueous solvent
10 comprising between generally about 50% to 90% by weight of the
11 aqueous paint component. In one preferred embodiment, the
12 aqueous solvent comprises between generally about 70% to 80% by
13 weight of the aqueous paint component, while in one other
14 preferred embodiment, the aqueous solvent comprises between
15 generally about 60% to 65% by weight.

16 In at least one embodiment of the present invention the
17 aqueous solvent may comprise an amount of water, however, it is
18 understood that other aqueous solvents may be utilized and that
19 compositions comprising such other aqueous solvents are also
20 included within the scope and intent of the present invention.
21 In one preferred embodiment, the aqueous solvent of the present
22 invention comprises an amount of filtered water and, more
23 specifically, an amount of filtered water which has been
24 filtered to remove chlorine and/or iron and/or ions thereof.

25 In addition to the aqueous solvent, the aqueous aerosol

1 paint component of the present invention comprises a polymeric
2 resin. Such polymeric resins are typically provided as a
3 carrier for one or more paint pigment compounds and, more
4 importantly, as a film forming agent which acts as an adhesive
5 interface between the pigment compounds and a surface on which
6 the paint composition is applied. In the present inventive
7 composition, the polymeric resin may comprise a polymeric
8 compound dispersion and, in particular, an aqueous polymeric
9 compound dispersion. In one preferred embodiment, the polymeric
10 compound dispersion comprises a short chain polymer, such as
11 polyvinyl acetate, so as to facilitate the inhibition of
12 unwanted interaction between the polymeric resin with the other
13 compounds of the aqueous aerosol paint component of the present
14 invention. More in particular, the polyvinyl acetate dispersion
15 of one preferred embodiment of the present invention comprises
16 an aqueous dispersion of a short chain homopolymer of vinyl
17 acetate without a plasticizer, such as Mowilith D-50, a
18 polyvinyl acetate dispersion manufactured by Clariant Mexico,
19 S.A. de C.V.

20 The aqueous paint component of the inventive composition of
21 the present invention comprises the polymeric resin in an amount
22 of between generally about 5% to 10% by weight of the aqueous
23 paint component and, in one preferred embodiment of the present
24 invention, the aqueous paint component comprises generally about
25 6% by weight of a polyvinyl acetate dispersion.

1 Also as indicated above, the aqueous paint component of the
2 present invention further comprises at least one pigment
3 compound. The at least one pigment compound is structured to at
4 least partially define a color of the temporary aerosol paint
5 composition, and more in particular, a color of the composition
6 after applying to a surface and curing. In one preferred
7 embodiment, the at least one paint pigment compound is
8 structured to at least partially define a fluorescent color,
9 while in at least one other preferred embodiment, the at least
10 one pigment compound is structured to at least partially define
11 a white color. A further preferred embodiment of the present
12 invention comprises an aqueous paint component having a
13 plurality of pigment compounds to at least partially define a
14 color of the temporary aerosol paint composition.

15 One preferred embodiment of the present invention comprises
16 a benzoguanamine/formaldehyde condensate with organic dyes, such
17 as one of the Fiesta Daylight Fluorescent Colours, manufactured
18 by Swada (Limited) London, as the at least one pigment compound.
19 These pigment compounds may be utilized to at least partially
20 define such fluorescent colors as pink, red, orange, green,
21 blue, and yellow, just to name a few. At least one embodiment
22 of the present invention comprises one of the fluorescent
23 pigments comprising a formaldehyde-melamine-p-toluenesulfonamide
24 copolymer, such as is manufactured by the Sinlohi Co. Ltd. of
25 Japan.

1 Alternatively, the aqueous paint component of the present
2 invention may comprise at least one white pigment compound
3 comprising titanium dioxide such as, by way of example only,
4 Tronox CR-828, as manufactured by the Kerr-McGee Chemical
5 Corporation.

6 The at least one pigment compound of the aqueous component
7 of the present invention comprises between generally about %5 to
8 25% by weight. Tables I through VII below contain exemplary
9 formulations of the inventive composition of the present
10 invention for a number of color variations, including generally
11 the amount of specific pigment compounds in each.

12 The aqueous paint component of the present invention
13 further comprises at least one filler compound, however, one
14 preferred embodiment comprises a plurality of filler compounds.
15 In one embodiment, the at least one filler compound of the
16 aqueous paint component comprises an aluminum silicate compound.
17 Aluminum silicate compounds including, but not limited to,
18 kaolin or kaolinite have been included in paint compositions to
19 enhance viscosity, i.e. to increase the viscosity of the paint
20 composition, so as to limit running upon application to a
21 surface. In at least one other embodiment, the at least one
22 filler compound comprises a calcium carbonate compound. Such
23 calcium carbonate compounds have been utilized in paint
24 formulations to limit adsorption by porous surfaces such as may
25 be encountered, for example, when marking the location of

1 underground utility lines and/or other underground structures on
2 overlying concrete, asphalt, gravel, grass, and/or dirt. As
3 indicated above, however, one preferred embodiment of the
4 present invention comprises a plurality of filler compounds such
5 as, for example, an aluminum silicate compound and a calcium
6 carbonate compound.

7 At least one embodiment of the aqueous paint component of
8 the present invention comprises the at least one filler compound
9 in an amount of between generally about 1% to 10% by weight. In
10 one preferred embodiment, the aqueous paint component of the
11 present invention comprises a plurality of filler compounds each
12 in an amount of between generally about 1% to 10% by weight.
13 More in particular, one preferred embodiment of the aqueous
14 paint component comprises an aluminum silicate compound in an
15 amount of generally about 1.7% by weight and a calcium carbonate
16 compound in an amount of generally about 2.1% by weight. One
17 other preferred embodiment of the aqueous paint component of the
18 present invention comprises an aluminum silicate compound in an
19 amount of generally about 5.1% by weight and a calcium carbonate
20 compound in an amount of generally about 6.4% by weight. Once
21 again, Tables I through VII below contain exemplary formulations
22 of the inventive composition of the present invention for a
23 number of color variations, including generally the amount of
24 specific filler compounds in each.

25 One further embodiment of the aqueous paint component of

1 the present invention comprises a dispersant. In particular,
2 the aqueous paint component may comprise a dispersant structured
3 to balance the ionic forces between the various compounds
4 comprising the aqueous paint component, so as to enhance the
5 stability of these compounds in an aqueous medium. The aqueous
6 paint component of the present invention comprises the
7 dispersant in an amount of between generally about 0.10% to
8 1.00% by weight. More specifically, one preferred embodiment of
9 the aqueous paint component comprises the dispersant in an
10 amount of generally about 0.5% by weight, while one other
11 preferred embodiment comprises generally about 0.25% by weight.
12 In one preferred embodiment, the dispersant comprises a non-
13 ionic surfactant such as, by way of example only, Crisanol NF-
14 100, manufactured by Christianson S.A. de C.V., or a mixture of
15 Brimopol S 904 and Brimopol S 9010, each manufactured by
16 Polaquimia, S.A. de C.V.

17 The aqueous paint component of the present invention may
18 also comprise an anti-foaming agent. In particular, at least
19 one embodiment of the aqueous paint component of the present
20 invention comprises between generally about 0.10% and 0.50% by
21 weight of the anti-foaming agent. The anti-foaming agent is
22 included in the aqueous paint component to facilitate the
23 release of the minimal amount of volatile compounds present in
24 the aqueous paint component during application and cure, so as
25 to minimize irregularities in the surface of the cured paint

1 film due to the release of such volatile compounds. One
2 preferred embodiment comprises between generally about 0.20% and
3 0.25% by weight of the anti-foaming agent in the aqueous paint
4 component. In at least one embodiment, the anti-foaming agent
5 comprises an emulsion such as, by way of example only, Antifoam
6 H-10 Emulsion, manufactured by Dow Corning Corporation, although
7 it is understood that anti-foaming agents exhibiting similar
8 properties may be utilized.

9 In yet another embodiment of the temporary aqueous aerosol
10 paint composition of the present invention, the aqueous paint
11 component also comprises a surfactant. Similar to the
12 dispersant described above, the surfactant may be included to
13 enhance the stability of the aqueous paint component by
14 "balancing" the various interactive forces between the different
15 compounds. At least one embodiment of the present invention
16 utilizes an alcohol based compound as the surfactant, such as,
17 by way of example only, the ester alcohol compound Texanol as
18 manufactured by the Eastman Chemical Company. The aqueous paint
19 component of the inventive composition of the present invention
20 may comprise the surfactant between generally about 0.1% to 1.0%
21 by weight. More specifically, one preferred embodiment of the
22 aqueous paint component of the present invention comprises
23 generally about 0.85% by weight of the surfactant, while one
24 other preferred embodiment comprises generally about 0.10% by
25 weight of the surfactant.

1 The aqueous paint component of the present invention may
2 also comprise a bactericide, to minimize spoilage of the aqueous
3 paint component by the various bacterium to which it may be
4 exposed. The aqueous paint component preferably comprises an
5 aqueous based broad spectrum bactericide, and in one preferred
6 embodiment, the bactericide comprises 1,3-dihydroxymethyl-5,5-
7 dimethylhydantoin and 1-hydroxymethyl-5,5-dimethylhydantoin,
8 such as, for example, Troysan 395, manufactured by Troy Chemical
9 Company. A preferred embodiment of the aqueous paint component
10 comprises the bactericide in an amount of generally about 0.03%
11 by weight.

12 A further embodiment of the aqueous paint component of the
13 present invention may comprise a light stabilizer. More in
14 particular, the aqueous paint component comprises a light
15 stabilizer in formulations also comprising one or more colored
16 pigment compounds, to prevent premature degradation of the paint
17 composition following application and cure. The type and amount
18 of light stabilizer which the aqueous paint component comprises
19 is important to achieve the desired "temporary" aspect of the
20 inventive composition of the present invention. Specifically,
21 utilization of the incorrect type and/or amount of the light
22 stabilizer will result in a paint composition which either
23 degrades too quickly or too slowly, following application and
24 cure, via exposure to the ultra-violet rays of the sun.

25 The light stabilizer utilized in the present invention may

1 comprise, in one preferred embodiment, a combination of
2 polymeric benzotriazole compounds such as, by way of example
3 only, Tinuvin 5151, manufactured by Ciba Specialty Chemicals
4 Corporation U.S.A. Further, the aqueous paint component of the
5 inventive composition of the present invention may comprise the
6 light stabilizer in an amount of generally about 0.6% by weight,
7 in one preferred embodiment. As illustrated below in the
8 exemplary formulations of Tables I through VII, the light
9 stabilizer is only included in the formulations comprises one or
10 more colored pigment compounds.

11 In addition to the aqueous paint component, the temporary
12 aqueous aerosol paint composition of the present invention also
13 comprises an aqueous propellant component. The aqueous
14 propellant component may comprise between generally about 10% to
15 40% by weight of the temporary aqueous aerosol paint
16 composition. One preferred embodiment of the aqueous propellant
17 component comprises an aqueous dimethyl ether compound and, in
18 this preferred embodiment, the aqueous propellant component
19 comprises generally about 25% by weight of the temporary aqueous
20 aerosol paint composition. In at least one embodiment, the
21 aqueous propellant component of the present invention comprises
22 the aqueous dimethyl ether compound Dymel, manufactured by
23 DuPont Fluoroproducts.

24 The following tables, Tables I through VII, provide
25 exemplary formulations of one preferred embodiment of the

aqueous paint component of the composition of the present invention for several possible color variations. These exemplary formulations list generally the amount of each specific compound in each embodiment. The weight percentages indicated in the following tables are for illustrative purposes only, and are not intended to imply exact values for purposes of limiting the scope of the present invention, rather they are presented to illustrate the combinations and amounts of the aforementioned compounds which various embodiments of the aqueous paint component of the present invention may comprise.

TABLE I - FLOURESCENT PINK AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	72%
polyvinyl acetate dispersion	6%
flourescent pink pigment compound	15%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE II - FLOURESCENT RED AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	72%
polyvinyl acetate dispersion	6%
flourescent red pigment compound	10%
organic red pigment compound	5%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE III - FLOURESCENT ORANGE AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	73%
polyvinyl acetate dispersion	6%
flourescent orange pigment compound	14%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE IV - FLOURESCENT GREEN AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	71%
polyvinyl acetate dispersion	6%
flourescent green pigment compound	16%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE V - FLOURESCENT BLUE AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	78%
polyvinyl acetate dispersion	6%
flourescent blue pigment compound	9%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE VI - FLOURESCENT YELLOW AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	70%
polyvinyl acetate dispersion	6%
flourescent yellow pigment compound	17%
aluminum silicate compound	2%
calcium carbonate compound	2%
dispersant	0.5%
anti-foaming agent	0.25%
surfactant	0.8%
bactericide	0.03%
light stabilizer	0.6%

TABLE VII - WHITE AQUEOUS PAINT COMPONENT

Compound	Weight Percent
water	63%
polyvinyl acetate dispersion	6%
white pigment compound	18%
aluminum silicate compound	5%
calcium carbonate compound	6%
dispersant	0.25%
anti-foaming agent	0.23%
surfactant	0.1%
bactericide	0.03%

1 The present invention also comprises a method for preparing
2 a temporary aqueous aerosol paint composition, such as the
3 composition described above. More in particular, the present
4 invention encompasses a method for preparing an aqueous paint
5 component of a temporary aqueous aerosol paint composition, as
6 described above.

7 The method of the present invention comprises charging a
8 reaction vessel with an initial amount of an aqueous solvent.
9 The reaction vessel may comprise any number of configurations
10 with respect to volume and geometry, provided that the reaction
11 vessel includes means for thoroughly mixing the contents of the
12 reaction vessel, i.e. the compounds comprising the aqueous paint
13 component, at each predetermined mixing speed indicated below.
14 In addition, the reaction vessel includes means for controlling
15 the temperature of the contents of the reaction vessel as
16 required, also as indicated below. As will be appreciated, the
17 actual quantity of the temporary aqueous aerosol paint
18 composition which may be prepared utilizing the present
19 inventive method may be easily adjusted by modifying the amounts
20 of the various compounds relative to the final amount desired,
21 and providing a reaction vessel suited to thorough mixing and
22 temperature control of this actual quantity.

23 In the method of the present invention, the aqueous solvent
24 may comprise an amount of water, and in one preferred
25 embodiment, an amount of filtered water. As described above,

1 the amount of filtered water may be filtered to remove chlorine,
2 and/or iron and/or ions thereof. Charging the reaction vessel
3 with the initial amount of aqueous solvent comprises adding an
4 amount of aqueous solvent to the reaction vessel which is
5 generally about 20% by weight of a total amount of aqueous
6 solvent to be added.

7 The method of the present invention further comprises
8 setting a primary mixing cycle for the contents of the reaction
9 vessel. Specifically, setting the primary mixing cycle comprises
10 adjusting a mixing speed for the contents of the reaction vessel
11 to approximately 1,800 revolutions per minute (rpm), and
12 maintaining the mixing speed at approximately 1,800 rpm for
13 generally about 10 to 15 minutes.

14 Additionally, the method of the present invention also
15 comprises adding at least one pigment compound to the reaction
16 vessel. The at least one pigment compound may comprise, for
17 example, any of the pigment compounds described above, and in an
18 amount of between generally about 5% to 25% by weight of the
19 aqueous paint component. One embodiment of the present method
20 comprises adding the at least one pigment compound to the
21 reaction vessel during the primary mixing cycle, preferably,
22 just after setting the primary mixing cycle. In addition, the
23 at least one pigment compound is preferably added slowly,
24 thereby allowing the at least one pigment compound to mix
25 thoroughly with the aqueous solvent. At least one embodiment of

1 the present method further comprises adding a plurality of
2 pigment compounds to the reaction vessel, the plurality of
3 pigment compounds being of the type and generally in the amounts
4 indicated above for pigment compounds.

5 The method of the present invention also comprises adding
6 an additional amount of the aqueous solvent to the reaction
7 vessel. In one preferred embodiment, the method comprises
8 adding an additional amount of the aqueous solvent wherein the
9 additional amount is generally about 10% by weight of the total
10 amount of aqueous solvent to be added.

11 In addition, the method for preparing an aqueous paint
12 component of a temporary aqueous aerosol paint composition
13 further comprises adding a dispersant to the reaction vessel.
14 In one preferred embodiment, the dispersant comprises a non-
15 ionic surfactant as described above, and in an amount of between
16 generally about 0.10% to 1.00% by weight of the aqueous paint
17 component in the reaction vessel.

18 The method of the present invention further comprises
19 setting a high velocity mixing cycle for the contents of the
20 reaction vessel. More in particular, setting the high velocity
21 mixing cycle comprises adjusting a mixing speed for the contents
22 of the reaction vessel to approximately 2,300 rpm, and
23 maintaining the mixing speed at approximately 2,300 rpm for
24 generally about 60 minutes. In addition, the method comprises
25 controlling a temperature of the contents of the reaction vessel

1 at approximately, but not exceeding, thirty degrees Celsius (30°
2 C), during at least the high velocity mixing cycle.

3 One embodiment of the present method comprises adding at
4 least one filler compound to the reaction vessel. The at least
5 one filler compound may be added in accordance with the amount
6 previously described, being between generally about 1% to 10% by
7 weight of the aqueous paint component. Further, adding the at
8 least one filler compound to the reaction vessel may comprise
9 adding one of the filler compounds disclosed above,
10 specifically, an aluminum silicate compound or a calcium
11 carbonate compound.

12 In one preferred embodiment, the method of the present
13 invention comprises adding a plurality of filler compounds to
14 the reaction vessel, each comprising between generally about 1%
15 to 10% by weight of the aqueous paint component. Specifically,
16 one preferred embodiment of the present method comprises adding
17 an aluminum silicate compound and a calcium carbonate compound,
18 each in an amount of generally about 2% by weight of the aqueous
19 paint component. In one other preferred embodiment, the present
20 method comprises adding an aluminum silicate compound in an
21 amount of generally about 5% by weight of the aqueous paint
22 component and a calcium carbonate compound in an amount of
23 generally about 6% by weight.

24 The method of the present invention further comprises
25 setting a first low velocity mixing cycle for the contents of

1 the reaction vessel. More in particular, setting the first low
2 velocity mixing cycle comprises adjusting a mixing speed for the
3 contents of the reaction vessel to approximately 800 rpm, and
4 maintaining the mixing speed at approximately 800 rpm for
5 generally about 5 to 10 minutes. In one preferred embodiment,
6 the present method further comprises adding an anti-foaming
7 agent to the reaction vessel in an amount of between generally
8 about 0.10% and 0.50% by weight of the aqueous paint component.
9 One further preferred embodiment comprises adding an amount of
10 a surfactant to the reaction vessel in an amount of between
11 generally about 0.05% to 1.00% by weight of the aqueous paint
12 component. In at least one embodiment of the present method,
13 the anti-foaming agent may comprise an emulsion, and the
14 surfactant may comprise an alcohol based compound, as disclosed
15 above. Preferably, the anti-foaming agent and the surfactant
16 are added to the reaction vessel as the mixing speed is being
17 reduced from the high velocity mixing speed to the first low
18 velocity mixing speed.

19 At least one embodiment of the present method for preparing
20 an aqueous paint component of a temporary aqueous aerosol paint
21 composition comprises adding a bactericide to the reaction
22 vessel. In at least one embodiment, the bactericide comprises an
23 aqueous based broad spectrum bactericide as described above, in
24 an amount of between generally about 0.10% to 1.00% by weight of
25 the aqueous paint component in the reaction vessel. In one

1 preferred embodiment, adding the bactericide comprises adding
2 the bactericide in an amount of generally about 0.03% by weight
3 of the aqueous paint component.

4 The method of the present invention may also comprise
5 adding an amount of a light stabilizer to the reaction vessel.
6 The light stabilizer may comprise a polymeric benzotriazole, as
7 indicated above. One preferred embodiment of the method of the
8 present invention comprises adding the light stabilizer in an
9 amount of generally about 0.6% by weight of the aqueous paint
10 component.

11 The present method for preparing an aqueous paint component
12 of a temporary aqueous aerosol paint composition further
13 comprises adding a polymeric resin to the reaction vessel, the
14 polymeric resin comprising between generally about 5% to 10% by
15 weight of the aqueous paint component. One preferred embodiment
16 of the present invention comprises adding the polymeric resin to
17 the reaction vessel in an amount of generally about 6% by weight
18 of the aqueous paint component. In addition, in a preferred
19 embodiment, the polymeric resin comprises an aqueous polymeric
20 compound dispersion and, more specifically, a polyvinyl acetate
21 dispersion, as previously disclosed.

22 The method of the present invention further comprises
23 setting a second low velocity mixing cycle for the contents of
24 the reaction vessel. More in particular, setting the first low
25 velocity mixing cycle comprises adjusting a mixing speed for the

1 contents of the reaction vessel to approximately 600 rpm, and
2 maintaining the mixing speed at approximately 600 rpm for
3 generally about 10 to 15 minutes.

4 Additionally, the method of the present invention comprises
5 adding a final amount of aqueous solvent to the reaction vessel,
6 the final amount of aqueous solvent comprising generally about
7 70% by weight of the total amount of aqueous solvent added to
8 the reaction vessel.

9 The present invention further comprises a method for
10 charging an aerosol can with a temporary aqueous paint
11 composition, such as disclosed above, thereby permitting a ready
12 means for applying the inventive composition as required. One
13 preferred embodiment comprises charging an aerosol can
14 specifically designed for inverted application of the aqueous
15 aerosol paint composition of the present invention.

16 Specifically, the method comprises charging the aerosol can
17 with an amount of an aqueous paint component, such as may be
18 prepared via the method disclosed herein. In one preferred
19 embodiment, the method comprises charging the aerosol can with
20 an amount of the aqueous paint component comprising generally
21 about 75% by weight of the aqueous aerosol paint composition.
22 The method may further comprise installing a valve on the can to
23 permit controlled application of the contents therefrom. Also,
24 the present method comprises charging the aerosol can with an
25 amount of an aqueous propellant. In a preferred embodiment, the

1 method includes charging the aerosol can with an aqueous
2 dimethyl ether compound in an amount of generally about 25% by
3 weight of the aqueous paint composition, such as the inventive
4 temporary aqueous aerosol paint composition disclosed herein.

5 Since many modifications, variations and changes in detail
6 can be made to the described preferred embodiment of the
7 invention, it is intended that all matters in the foregoing
8 description be interpreted as illustrative and not in a limiting
9 sense. Thus, the scope of the invention should be determined by
10 the appended claims and their legal equivalents.

11 Now that the invention has been described,